

Research Report

Sugarbeet Conference, Fort Collins, Colorado

February 5, 6, 1974

Prepared by C. F. Ehlig, December 10, 1973

- A. Location of Project: Western Region
Southern California-Hawaii Area
Imperial Valley Conservation Research Center
Brawley, California
- B. Work Reporting Unit Titles: Efficient Irrigation and Agricultural
Water Use; Reducing Salt Damage to Soils,
Waters, and Plants.
- C. Work Reporting Units: Nos.: 12270 and 12290
- D. SMY's for Past Year at Location: 1/6 SMY
- E. Names of Scientists in Project at Location: C. F. Ehlig and R. D. LeMert
- F. Mission of Research:

To determine the influence of water management practice, soil salinity, and climate on the yield of sugar from sugarbeets; to develop and evaluate cultural practices for the most efficient use of soil, water, and energy in the production of sugarbeets, to develop criteria and methods for selecting and testing of salt tolerance in sugarbeets.

- G. Objectives of Research:

To determine the influence of irrigation regime on consumptive use of water and yield of sucrose in sugarbeets; to determine the effects of these irrigation regimes on the salt balance in the soil, to determine the influence of soil nitrate level, irrigation regime, and climate on the incidence of late root rot in sugarbeets; to determine the effects of soil salinity on sucrose extraction efficiency; to establish criteria and methods for testing salt tolerance in sugarbeets.

- H. Research Accomplishments:

In cooperative research with sugar crops geneticists, a laboratory technique for evaluating the salt tolerance of sugarbeets during seed germination and seedling emergence was developed. The salt tolerance of several cultivars was tested with this method. Field studies on increases in size, dry weight and sucrose content, by 2 week increments, during spring were conducted in 1971. Current studies include: water use and productivity of sugarbeets under 5 irrigation regimes designed for water conservation; the effect of high soil nitrates and irrigation

regime on incidence of late root rot; the effect of chiselling under the seed row at planting on root development.

I. Impact of Research Accomplishments on Science and General Public:

The primary impact would be an increase in net profit to farmers. Sugarbeets consistently rank among the top 4 crop plants grown in the Imperial Valley. In 1972, sugarbeets ranked second in acreage (61,000 ac) and third in cash value (\$28,000,000). According to data supplied by the Imperial Irrigation District, farmers have applied in previous years seasonal amounts of water ranging from 3 to 8 feet, although a majority of seasonal amounts of water varied between 4 to 6 feet. Implementation of irrigation practices based on evapotranspiration from a sugarbeet field should effect a substantial decrease in the seasonal amounts of water applications to sugarbeets and still provide for cooling the seedbed temperature during seed germination and for adequate leaching of water borne salts from the root zone. Applications of knowledge on the relationship(s) between incidence of late root rot and high soil and plant nitrates, irrigation regime, and climate might reduce high economic losses from root rot in individual fields during some years. Information on the effects of salinity on sucrose extraction efficiency may also lead to practices, i.e., selection of fields, for a higher percent in sucrose extraction. Research on extractible sucrose is suggested on the assumption that industry will change their basis for payments from total sucrose to extractable sucrose within the next few years.

J. Obstacles to Achieving Objectives:

Except for the study of salt tolerance, the sugarbeet has been one of several crops used in testing and evaluating water management principles and practices rather than being used as a specific test crop. Additional manpower and financial support is needed to study the sugarbeet as a specific crop.

K. Future Plans and Needs:

Further studies are not planned although a definite need exists for additional research in the aforementioned area.